ENTOMOLOGY.—*Type specimens of mosquitoes in the United States National Museum: III, The genera* Anopheles *and* Chagasia (*Diptera, Culicidae*).[1]

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The introductory remarks in the first paper of this series, particularly those on early, possibly questionable holotypes, also apply to this one. Following our treatment of nominal taxa requiring special attention we present a list of those in the collection based on unique specimens or for which holotypes were clearly designated.

Genus **Anopheles** Meigen

Anopheles apicimacula Dyar and Knab, Proc. Biol. Soc. Washington **19:** 136. 1906.

Of the 26 original specimens of this species, 22 are in the collection. One female only, from Livingston, Guatemala, May 11, bears a type label, and this we consider the holotype. This specimen was designated as lectotype in Russell, Rozeboom, and Stone (1943, p. 31) although we now feel that this lectotype designation was not necessary, as explained in the introduction to this series.

Anopheles atropos Dyar and Knab, Proc. Biol. Soc. Washington **19:** 160. 1906.

The syntype series of this species consisted of seven female specimens from the Florida Keys, collected by H. Byrd. All these are in the collection and all are labeled "Type No. 10029 U.S. N.M." We select as lectotype one of the best of these specimens.

Anopheles (*Kerteszia*) *bambusicolus* Komp, Ann. Ent. Soc. Amer. **30:** 515. 1937.

The syntype series of this species consisted of three females with associated larval skins. These specimens stand in the collection all bearing the labels "La Union, Int. de Meta, Colombia, Sept. 1935. Jorg Boshell / On bamboo / Cotype No. 53075." There are four larval skins on slides, but since the pinned specimens are not numbered these skins cannot be associated with individual specimens. Two of the pinned specimens are *Anopheles bambusicolus* Komp, and we select the better one as lectotype. The third is a specimen of *Culex chryselatus* Dyar and Knab and has been transferred to that species in the collection.

Anopheles barberi Coquillett, Can. Ent. **35:** 310. 1903.

This species was described from three females collected on Plummers Island, Md., August 14, 1902, and August 17 and 19, 1903. Only one of these specimens, dated August 17, is in the collection, and it bears the type label and Coquillett's determination label. We consider this specimen to be the holotype.

Anopheles bellator Dyar and Knab, Proc. Biol. Soc. Washington **19:** 160. 1906.

The original three specimens of this species are in the collection, consisting of one male and two females, all labeled "Type No. 10027 U.S.N.M." We select as lectotype the male labeled "44.1 / Trinidad, W.I. Jan. / Aug. Busck Collector / See slide No. 314 / Slide #659 / bellator." The terminalia are on slide no. 314, and one front tarsus is on slide no. 659. The pupal skin from which this specimen came has also been mounted on a slide.

Anopheles (*Dendropaedium*) *bellator* race *bromelicola* Dyar and Knab, Ins. Insc. Mens. **13:** 27. 1925.

The two female syntypes of this, from Manoa, Orinoca River, Venezuela, are in the collection, each bearing only the labels "Manoa Woods Jan 10 / Type No. —— U.S.N.M." We select one of these as lectotype.

[1] Earlier papers in this series are: *I, The genera* Armigeres, Psorophora, *and* Haemagogus, Journ. Washington Acad. Sci. **45**: 282–289. 1955; *II, The genus* Aedes, *ibid.* **46**: 213–228. 1956.

[2] Studies upon which this paper is based were conducted under an exchange of funds from the Office of Naval Research (Biological Science Division) to the Smithsonian Institution. The opinions or assertions contained here are the private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

Anopheles (*Anopheles*) *chiriquiensis* Komp, Proc. Ent. Soc. Washington **38:** 156. 1936.

Both sexes and the larva of this species were originally described, but no type material was mentioned. The collection contains one male and one female labeled "Anopheles chiriquiensis Komp / Volcan de Chiriqui, Panamá II.7.35 6500 ft / Cotype No. 51882 U.S.N.M. / W.H.W. Komp." The male is labeled ♂1, and this has dissected terminalia mounted on a slide. There is a second female of the original material, not labeled as cotype, and one larval skin, not associated by label with any specific adult. We select the male as lectotype.

Anopheles (*Nyssorhynchus*) *darlingi* Root, Amer. Journ. Hyg. **6:** 706. 1926.

The lectotype male of this species, selected by Stone in Ross and Roberts (1943, p. 30), is in the collection.

Anopheles (*Nyssorhynchus*) *davisi* Paterson and Shannon, Terc. Reun. Soc. Arg. Mosq. de Embarcación: 5. 1927.

This species was described from 6 larvae, 50 females, and 2 males from Trez Pozos, Embarcación, Salta, Argentina. The collection contains a larval slide and two male terminalia slides bearing the original data, and four pinned females collected at the proper time but at Bella Vista, Embarcación, not Trez Pozos. The larva and one of the male slides were labeled "Type" by Shannon, but the adults from which the male terminalia came are not in the collection. There is no indication in the original publication as to where the types were to be deposited, and it is quite possible that there are more and better specimens of the syntype series in Argentina. Because of this, it seems advisable to defer selection of a lectotype.

Anopheles (*Nyssorhynchus*) *dunhami* Causey, Journ. Nat. Malaria Soc. **4:** 231–234. 1945.

The original description of this species states, "The type specimens have been forwarded to the National Museum in Washington, D. C." There is no statement as to the number of specimens involved, although the species was collected in large numbers on animal bait in Tefé, Amazonas, Brazil, and the female, male, egg, and larva are described. The collection contains a male labeled type and a female labeled paratype, both reared from eggs laid by a female collected in Tefé, Amazonas, Brazil. We consider this male, with terminalia mounted on a slide, to be the holotype.

Anopheles earlei Vargas, Bol. Ofic. Sanit. Panamericana **22:** 8. 1943.

The original description of this species designated a male holotype with the dissected terminalia mounted on two slides and a female allotype. The type locality was given as being Jefferson County, Wis. The type was collected July 10, the allotype July 13. These specimens are in the collection bearing these data. For this reason the statement in Vargas and Matheson (1948, p. 27) that "El tipo macho fue de Cayuta Lake, Nueva York" is erroneous.

Anopheles eiseni Coquillett, Journ. New York Ent. Soc. **10:** 192. 1902.

This species was described from one female and two males. Two of the original specimens are in the collection, one of the males not being found. The female only bears a type label and it also bears Coquillett's determination label. This specimen we consider to be the holotype.

Cellia flava Ludlow, Can. Ent. **40:** 32. 1908.

This species was described from four specimens, which are in the collection, bearing unnumbered type labels. These specimens are all females, although the original description includes both sexes. We select as lectotype the specimen bearing the label "Cellia flava Ludl. Type" and some indecipherable words. There are other specimens from Tayabas, the type locality, including males, that might have been before Ludlow when she described the species.

Myzomyia flavirostris Ludlow, Psyche **21:** 30. 1914.

It is not clear from the original description that this species was based on more than one specimen, but the collection has four females bearing unnumbered type labels. Only one has an additional label, as follows: "*M. funesta* Giles dark *flavirostris*. Camp Wilhelm, Tayabas, P. I. Type. Nov." The word "*flavirostris*" is written in pencil, and the word "Type" is apparently written with a different pen from the rest of the label. This specimen is the best of the four and we select it as lectotype.

Anopheles formosus Ludlow, Can. Ent. **41:** 22. 1909.

This species was presumably described from a single female, but it is not clearly so stated in the original description. We consider the single female, with the labels "Type No. 27781 U.S. N.M. / Anopheles formosus Ludl. Type C.S.L. Camp John Hay. Benguet, P. I. Mch 20, 1908" as the holotype.

Anopheles (*Kerteszia*) *homunculus* Komp, Ann. Ent. Soc. Amer. **30:** 509. 1937.

The syntype series of this species consisted of three females and one male. The collection now has two females and one male labeled as cotypes, associated with three numbered larval skins on one slide and the terminalia of the male on another slide. We select as lectotype the male with the associated larval skin no. 3, collected by Komp at Restrepo, Colombia, September 9, 1935.

Culex hyemalis Fitch, Amer. Journ. Agr. and Sci. **5:** 281. 1847.

The original description gives no indication of any type material, stating merely that the species is "met with in the last days of autumn and again for a short time in the first days of spring" and "is a somewhat rare insect." The collection contains a single female bearing the labels "6850 / Type No. ——— U.S.N.M. / Fitch Collection / Anopheles Meigen hyemalis Fitch New York." Not knowing whether any other Fitch specimens of this species are in existence, we select this specimen as lectotype.

Myzomyia rossi var. *indefinita* Ludlow, Can. Ent. **36:** 299. 1904.

This variety was described from an indefinite number of specimens from a variety of localities in the Philippines, some of them not named. The collection contains the following syntypes, or presumable syntypes: (1) Four females, each bearing the red label "Type No. 27779 U.S.N.M." (one of these specimens bears the label in Ludlow's hand "Myzomyia indefinita Ludl. P. I. Type C.S.L.); (2) two females labeled only "M. indefinita Ludlow Cotype"; and (3) nine specimens labeled only "Guimaras Isl. P. I. Dr. LeWald." These latter may not have been of the original Guimaras Island material, but they probably were. Most of the specimens are in very poor condition, particularly those of the first series, and except for the third series mentioned above, none bear any label for a specific locality in the Philippines. Since one of the best specimens, and one that agrees well with the original description and the current concept of the species, is one of the two of series (2) above, we select this one as lectotype.

Anopheles lewisi Ludlow, Psyche **27:** 14. 1920.

Aitken (1945, p. 308) designated lectotypes from the syntype series on which this name is based. This designation is somewhat obscure, since it appears that Aitken is referring to *lewisi* in making these selections but he uses two U. S. National Museum numbers. For the lectoholotype male he refers to U. S. National Museum no. 77812, which presumably refers to U.S.N.M. Type no. 27812, the number for the syntype series of *lewisi*; for the lectoallotype he says, "*A. Lewisi* (U. S. National Museum no. 77813)" which he may have intended to mean U.S.N.M. Type no. 27813, the type number for the two syntype females of *Anopheles selengensis* Ludlow. The collection contains a male and female of *lewisi*, labeled by Aitken as lectoholotype and lectoallotype respectively and a female of *selengensis* labeled lectoholotype, all collected at the same place and date. We accept the male lectotype for *lewisi*, and here designate as the lectotype of *selengensis* the female labeled by Aitken.

Stethomyia lewisi Shannon, Proc. Ent. Soc. Washington **33:** 154. 1931.

The male holotype, female allotype, and a female paratype were said to have been deposited in the U. S. National Museum collection. We have found no pinned specimens bearing type data, but there are two slides of fragments of male terminalia from the type locality, Rio Curupire, Bahia, Brazil. One of these slides has one complete set of terminalia and a portion of another, and the other has dissected claspettes. These slides are not labeled as types, and it would be impossible to tell which fragments belong to the holotype male, if any do. We can either assume that the type is lost or that the type is present in part but unlabeled.

Anopheles malefactor Dyar and Knab, Journ. New York Ent. Soc. **15:** 198. 1907.

The seven specimens on which this species was based are all in the collection and each bears the label "Type No. 10877 U.S.N.M." We select as

lectotype a female which also bears the labels "136.1 / Rio Chagres, Panama / Collected by August Busck / Anopheles malefactor D. & K. Type." There is a slide of the pupal skin and a portion of the abdomen of the larval skin. The fifth hind tarsomere is entirely white in this specimen, as given in the original description. Some of the other syntypes have a rather narrow dark ring on this tarsomere.

Anopheles neivai Howard, Dyar and Knab, Mosquitoes of North and Central America and the West Indies **4:** 966. 1917.

Although in the original description this species was said to have been found from Panama northward to southern Mexico, and localities are given in two places in Panama, two in Costa Rica, and one in Mexico, there are only three specimens in the collection under this name that can be considered to be of the original material. One of these, a female, bears the labels "344.1 / Type No. 20440 U.S.N.M. / neivai!" The number refers to Jennings' collection notes which state that the data for this number are "Fort San Felipe, Porto Bello Bay [Panama], June 2, 1908." The pupal skin and larval head capsule are mounted on a slide. This specimen we select as lectotype. A second female, from Panama, bears the label "Paratype No. 20440 U.S.N.M.," and a third one, from Estrella, Costa Rica, bears a determination label but no type label.

Anopheles occidentalis Dyar and Knab, Proc. Biol. Soc. Washington **19:** 159. 1906.

Most of the 118 original specimens of this species are in the collection, but only one, from Stanford University, California, May 26, 1903, bears a type label, and so we consider this to be the holotype. This specimen is in excellent condition. Aitken (1945, p. 285) has discussed the two species involved in the original series of this species.

Anopheles oiketorakras Osorno-Mesa, Caldasia **4:** 431–446, 1947.

This species was described from a male and a female designated as types, and other adults designated as paratypes. We select as lectotype the male "type" labeled "Bogotá, Colombia, S. A. Monserate, 2700–2840 m., III.13.46."

Myzomyia parangensis Ludlow, Psyche **21:** 129. 1914.

This species was described from more than one specimen, but the exact number was not stated. There are two females in the collection, each bearing the label "Type No. 27778 U.S.N.M." One is in excellent condition and bears the additional label "*Myzomyia parangensis* Ludl. Port of Parang, Mindanao, P. I., Oct. Nov. Types." The second is in poor condition and bears no additional label. Presumably the one label was intended for both. We select the first specimen as lectotype.

Anopheles philippinensis Ludlow, Journ. New York Ent. Soc. **10:** 129. 1902.

The number of specimens on which this species was based was not stated. Two females in the collection each bear the label "Type No. 27703 U.S.N.M." and one of them the label "Nyssorhynchus philippinensis Ludl. San Jose, Abra, P. I. Sept. 1, 1901. Type." Both of the specimens are in very poor condition, with hind legs missing. The one with palpi shows the terminal pale band on each palpus equal in length to the preapical dark band, and both specimens show a patch of pale scales on the sternopleuron, in both respects differing from the key characters used by Puri (1949). The specimen bearing Ludlow's original type label is in the worse condition, but the other is not much better. We refrain from selecting a lectotype because the specimens are in such poor condition that such selection would serve little purpose. The wing pattern differs slightly between the two specimens. If a lectotype is to be selected it should be only after a very thorough study of the species or species complex over its whole range.

Anopheles pseudobarbirostris Ludlow, Journ. New York Ent. Soc. **10:** 129. 1902.

The number of specimens on which this species was based was not stated. Two females in the collection each bears the label "Type No. 27782 U.S.N.M." and one of them the label "*Myzorhynchus pseudobarbirostris* Ludl. Type, Hagonoy, Bulacan, P. I. Oct. 2, 1901. Kellogg. Type." We designate this latter specimen as lectotype of the species.

Anopheles selengensis Ludlow, Psyche **27:** 77. 1920.

See remarks under *Anopheles lewisi* Ludlow.

Anopheles (*Nyssorhynchus*) *strodei* Root, Amer. Journ. Hyg. **6:** 711, 1926.

A male and a female of this species from the type locality are in the collection. We select as lectotype the male bearing a square of red paper and the labels "Agua Limpa, Braz. Mar. 27, 1925. No. 64 / Anopheles strodei Root types." The female bears the same data.

Myzomyia thorntonii Ludlow, Can. Ent. **36:** 69. 1904.

The collection contains three females of this species marked as types. Two of these each bear the label "Type No. 27780 U.S.N.M." put on by Dyar and one of these bears the additional label, in Ludlow's hand, "Myzomyia thorntonii Ludl. Cottabatto, Mindanao, P. I. June. Type C.S.L." The second specimen bears no data label, but Dyar entered both in the type book as being from the same locality. The third specimens bears an unnumbered type label and the label "M. Thorntoni Ludlow cotype" with no further data. Since Ludlow mentioned only two specimens, from two different localities, it is evident that some mislabeling has occurred. None of these specimens are in very good condition but they appear to be conspecific. We select as lectotype the specimen bearing the numbered type label and the collection data.

Anopheles vestitipennis Dyar and Knab, Proc. Biol. Soc. Washington **19:** 136. 1906.

The lectotype female designated by Stone in Russell, Rozeboom, and Stone (1943, p. 34) is in the collection.

The following taxa are based either on unique specimens or on clearly designated holotypes:

Anopheles (*Stethomyia*) *acanthotorynus* Komp, 1937
Anopheles (*Nyssorhynchus*) *anomalophyllus* Komp, 1936
Anopheles (*Kerteszia*) *anoplus* Komp, 1937
Anopheles lindesayi var. *benguetensis* King, 1931
Anopheles crucians var. *bradleyi* King, 1939
Anopheles (*Myzomyia*) *clowi* Rozeboom and Knight, 1946
Anopheles (*Myzomyia*) *cristatus* King and Baisas, 1936
Anopheles (*Nyssorhynchus*) *emilianus* Komp, 1941
Anopheles (*A.*) *fluminensis* Root, 1927
Anopheles crucians var. *georgianus* King, 1939
Anopheles (*Nyssorhynchus*) *goeldii* Rozeboom and Gabaldon, 1941
Anopheles gorgasi Dyar and Knab, 1907
Anopheles (*Nyssorhynchus*) *guarani* Shannon, 1928
Anopheles koliensis Owen, 1945
Anopheles nimbus var. *kompi* Edwards, 1930
Anopheles vagus var. *limosus* King, 1932
Chagasia lineata Ludlow, 1908
Anopheles litoralis King, 1932
Anopheles (*Myzomyia*) *lungae* Belkin and Schlosser, 1944
Anopheles (*Myzomyia*) *nataliae* Belkin, 1945
Anopheles (*Stethomyia*) *niveopalpis* Ludlow, 1919
Stethomyia pallida Ludlow, 1905
Anopheles perplexens Ludlow, 1907
Anopheles punctimacula Dyar and Knab, 1906
Anopheles (*Myzomyia*) *leucosphyrus* var. *riparis* King and Baisas, 1936
Anopheles (*A.*) *samarensis* Rozeboom, 1951
Anopheles (*A.*) *saperoi* Bohart and Ingram, 1946
Anopheles (*Nyssorhynchus*) *sawyeri* Causey, Deane, Deane, and Sampaio, 1943
Anopheles (*A.*) *shannoni* Davis, 1931
Anopheles (*Myzomyia*) *solomonis* Belkin, Knight, and Rozeboom, 1945
Anopheles strigimacula Dyar and Knab, 1906

Genus **Chagasia** Cruz

Chagasia rozeboomi Causey, Deane and Deane, Amer. Journ. Hyg. **39:** 3. 1944; Journ. Nat. Malaria Soc. **4:** 341–350. 1945.

The first description of this species was of the egg only and there is probably no type specimen in existence. In 1945 the authors described the adults, larva, and pupa, and state that "Type specimens are deposited in the National Museum in Washington, D. C. U.S.A." A female in the collection bears the labels "Type specimen collected in Crato, Ceara, Brazil / Type No. 58039 U.S.N.M. / Chagasia rozeboomi Causey Deane and Deane 1944." Since the species was originally described from the egg alone, however, we must consider this specimen as a pseudotype.

The following species are based on unique holotype specimens:

Anopheles (*Chagasia*) *bathanus* Dyar, 1928
Chagasia bonneae Root, 1927

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